

A preliminary survey of the avifauna of Eminit Forest, Loima Hills, western Turkana District

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Eminit Forest, located in the Loima Hills of northern Kenya, is an essential part of the grazing lands of the Turkana people. The Turkana people are sub-divided into 17 groups, with five of these groups, the Ngisir, Ngimonia, Ngikamatak, Wayakwara and Lukumong, depending on the Loima ecosystem for dry season grazing (Oba 2001). Through tribal agreements the Turkana people have created an indigenous land-use system which is enforced by the tribal chiefs and adhered to the majority of the time. Eminit forest not only provides dry season grazing but also a refuge during periods of tribal instability and sporadic clashes that occur between the Turkana and Karamajong. As reported by Barrow (1988) and Oba (2001) the conservation of biodiversity at this site is not related to external management but indigenous knowledge and land-use, which has evolved out of a need to protect the natural resource for use during times of environmental stress and tribal instability. In terms of their effect on localised rainfall patterns and water catchment, the Loima Hills, and Eminit Forest in particular, are extremely valuable to the local pastoralist inhabitants as well as resident and migratory fauna.

The main aims of this survey were to establish a bird species list and note any species of conservation concern that may occur in the forest. An assessment of the threats to those species was made as part of a report for the UNDP/GEF Crossborder Biodiversity Project which was conducting a forest conservation project in the district.

Study site

The Loima Hills (also known as Murua Ngithigerr) are situated at 03°30'N, 35°00'E covering an area of approximately 160 km². Combined with the Puch Prasir plateau they cover a total area of 3000 km², representing one of the most extensive highland areas in Turkana District. Eminit Forest is situated on the Loima Hills plateau, from an altitude of 2050 m to a forested peak on its southern edge at 2286 m. The forested plateau is 9 km at its widest point (east to west axis), 15.8 km at its longest point (north to south axis) and covers an area of approximately 83 km² (all values measured from 1:250 000 map, series Y503, sheet NA-36-4, 1975). The lower slopes of the Loima Hills are accessed by bush road, a distance of 55 km east-north-east of Lodwar,

the provincial capital of Turkana District. Approximately 9 km (10%) of the western edge of Eminit Forest is located in Kenya bird atlas square 12D, the remainder being located in square 13C (Lewis & Pomeroy 1989).

The forested plateau is relatively flat with an altitudinal range of only 200 m over an area of 83 km², but the edges of the Loima Hills consist of steep slopes and cliffs which create an irregular drainage pattern over bare rock. Although there are more established drainage lines, no flowing water was observed in May 2001. The west and north-west slopes of the Loima Hills drain into the upper Tarach catchment system, the south and south-east areas into the Kosipur-Turkwell catchment and the Kaulathe-Turkwell catchments system drains the north-eastern slopes of the mountain (Barrow 1988).

The vegetation of the Loima Hills area is related to elevation more than terrain. The lower slopes largely comprise *Aristida mutabilis* and *Acacia mellifera* with *Acacia tortilis* dominating the vegetation along seasonal water courses and drainage lines. The soils are generally rocky and composed of euteric outcrops and calcic cambisols. The dry montane forest is dominated by *Juniperus procera*, *Olea europea*, *Olea capensis*, *Tecla nobilis* and *Podocarpus falcatus*, while the sparse undergrowth is composed of *Maytenus heterophylla*, *Dombeya goetzenii* and *Pistacia aethiopica* (Barrow 1988). The forest interior comprises mainly *Podocarpus falcatus* with *Juniperus procera*, with the latter dominating along ridges. These dominant species form a loose canopy at an estimated 25–30 m, with *Olea europea* and *O. capensis* forming a sub-canopy at an estimated 10–15 m. In approximately 65% of the forest visited, there was very little undergrowth, with saplings forming much of the vegetation structure between ground level and 5 m. There were occasional shrubs where breaks in the canopy had allowed light to penetrate, forming islands of forest edge habitat within the forest.

Large amounts of dead wood and leaf litter covered the forest floor providing a micro-environment for large numbers of invertebrates. Much of this dead wood seemed to be very old and the rate of decomposition slow which is possibly linked to the lack of moisture.

Methods

A combination of mist-netting, timed species counts (TSCs) and *ad hoc* observation were used to survey the avifauna in Eminit Forest over a period of ten days from the 30 April to 9 May 2001. Mist netting was carried out from 06:00 to 12:00 and 16:00 to 18:30. All birds caught were fitted with a standard Museum of Nairobi ring and the following biometric measurements were taken: tarsus, wing, bill, tail length and weight. These data, along with brood patch (six point scale from 0=none to 5=full) and moult data were deposited with the National Museum of Kenya, Nairobi.

Timed species counts were carried out in the mornings between 07:00 and 09:00 in forest, and between 18:00 and 19:00 at forest edge. Two counts were carried out each morning, the first being at a randomly selected point along a path, at least 500 m into forest. The second count was carried out 300 m (and no more than 15 minutes walk) from the first point in a direct line walked on a easterly compass bearing.

Only birds within a fixed radius of 25 m (estimate of error is 3 m, 12%) and 3 m above the ground were recorded. Each point was sampled for 40 minutes with observations being allocated to 5 minute time intervals giving scores of between 0 and 8 over the sample period. All other methods followed Bennun and Waiyaki (1992) All counts were made by the same two observers (Marc Baker and Njano Mbilinyi)

The results from Loima were compared with those from other northern dry montane forests, in particular Kulal and Njiru (Borghesio pers. comm.) and Moroto (Davenport *et al.* 1996). The main aim was to look at the similarity of these sites in terms of the avifauna known to occur, using Bray-Curtis cluster analysis. This uses group-average clustering to give a hierarchy of clusters indicating similarity as a percentage. The analysis concentrates on the forest dependant avifauna (both forest specialist and forest generalist) as defined by Bennun *et al.* 1996.

Results and discussion

A total of 87 species were recorded, representing 40 families and including three species of conservation concern (Bennun & Njoroge 1996). A full list is shown in the appendix. Of these 87 species, 48 were recorded in Eminit Forest and at forest edge (above 2050m), whilst the remainder were recorded in the dry Acacia woodland between 800 m (at the foot of the Loima Hills) and 2050 m.

Mist netting

A total of 2616 net-metre-hours (nmh) were completed over a five-day period, in which 13 birds were caught and processed (Table 1). The low number of captures reflects the low effort but also the low capture rate of 0.004 birds per nmh. This was probably due to the lack of a shrub layer within the forest which would normally help conceal the nets.

Table 1. Results from mist-netting in Eminit Forest.

Species	Ecol. Type	No. caught	Rank
White-eyed Slaty Flycatcher	F	3	1
Scaly-throated Honeyguide	f.	2	2
Grey-backed Camaroptera	f.	2	2
Brown Woodland Warbler	F	1	3
Yellow White-eye	f.	1	3
Brown-headed Tchagra	Fe	1	3
Cape-Robin Chat	f.	1	3
Amethyst Sunbird	f.	1	3
Variable Sunbird	f.	1	3

Almost all of the birds caught and ringed were forest species: two forest generalists (F), six forest users (f.) and one forest edge (fe) species.

Timed species counts

A total of 16 TSCs were carried out in forest interior and forest edge, giving a species list and index of relative abundance for each habitat type. The results for the timed species counts are shown in Tables 2 and 3 which indicate the commonest canopy and mid-stratum species in both the forest interior and forest edge.

In the forest interior, ten TSCs were carried out during which 13 species were recorded (Table 2). African Goshawk *Accipiter tachio*, Olive Pigeon *Columba arquatrix*, Narina Trogon *Apaloderma Narina* and Brown Woodland Warbler *Phylloscopus umbrovirens* were recorded only in forest interior.

Table 2. Results of timed species counts in forest interior, Eminit Forest.

Species	Ecol. Type	TSC Index	Rank
Brown Woodland Warbler	F	4.0	1
Olive Thrush	F	2.0	2
Grey-backed Camaroptera	f.	1.9	3
Dusky Flycatcher	F	1.4	4
White-eyed Slaty Flycatcher	F	0.9	5
Grey Cuckoo Shrike	FF	0.8	6
Amethyst Sunbird	f.	0.8	6
Yellow White-eye	f.	0.8	6
Olive Pigeon	F	0.7	7
Dusky Turtle Dove	f.	0.7	7
African Goshawk	F	0.6	8
Common Bulbul	f.	0.5	9
Narina Trogon	F	0.2	10

At forest edge, six TSCs were carried out in which 15 species were recorded (Table 3). Variable Sunbird *Cinnyris venusta*, Cape Robin-Chat *Cossypha caffra*, Baglafaect Weaver *Ploceus baglafaect*, Northern Puffback *Dryosvopus gambensis*, Paradise Flycatcher *Terpsiphone viridis* and Yellow-crowned Canary *Serinus canicollis* were all recorded only at forest edge.

Table 3. Results of timed species counts along forest edge, Eminit Forest.

Species	Ecol. Type	TSC Index	Rank
Variable Sunbird	f.	5.3	1
Amethyst Sunbird	f.	4.5	2
Yellow White-eye	f.	3.6	3
Common Bulbul	f.	3.6	3
Cape Robin Chat	F	3.5	4
Baglafaect Weaver	f.	2.6	5
Olive Thrush	F	2.6	5
Northern Puffback	F	1.3	6
Grey-backed Camaroptera	f.	1.3	6
Grey Cuckoo Shrike	FF	1.1	7
Paradise Flycatcher	F	1.1	7
Yellow Crowned Canary	f.	1.1	7
Dusky Flycatcher	F	0.6	8
White-eyed Slaty Flycatcher	F	0.6	8
Dusky Turtle Dove	f.	0.3	9

Species accounts

Great Sparrowhawk *Accipiter melanoleucus* (dark morph) was recorded four times carrying food in the same direction at dusk and thus suspected to be breeding. As all observations of this species were of a dark morph in the same location at approximately the same time it was presumed that this was the same individual.

Peregrine Falcon *Falco peregrinus* was recorded daily at dusk hunting over grassland. The presence of cliffs which this species requires for breeding make it likely that this was a resident bird. Heavy streaking on the breast indicated that this was a sub-adult bird.

White-crested Turaco *Tauraco leucolophus* was recorded in forest edge and riverine forest as low as 1800 m. It was absent from the forest interior and the dry woodland below 1800 m.

African Hill Babbler *Alcippe abyssinica* was recorded throughout the forested plateau. Cunningham-van Someren and Schifter (1981) described a separate race for Loima (*loima*) based on collections made by Joseph Mwaki in 1962.

Olive Thrush *Turdus olivaceus* was observed throughout habitat types above 2000 m, where it was recorded feeding in the ground layer, sub-canopy and canopy. This is usually a bird of the ground and shrub layer, so it is thought that the absence of a shrub layer combined with a lack of resource competition from greenbuls and hornbills (see below) may have allowed this species to occupy the canopy layer. Cunningham-van Someren and Schifter (1981) make reference to the sharp division between the extremely pale birds from Loima, Morongole, Karissia, Nguruman Range and those from other areas.

Brown Woodland Warbler *Phylloscopus umbrovirens* was the commonest bird in the forest interior (see TSC results, Table 2). A bird usually associated with shrub layer and small trees, this species predominantly occupied the sub-canopy and canopy, and was often recorded crawling through the *Juniperus-Podocarpus* canopy at over 30 m.

Cinnamon Bracken Warbler *Bradypterus cinnamomeus* was recorded twice in the undergrowth of forest clearings created by felled trees and undergrowth along drainage lines within the forest interior.

Baglact Weaver *Ploceus baglact emini*, is distributed in woodland and marsh between 800 m and 1200 m from north-west Uganda east to the Loima Hills. It was recorded in forest edge and clearings where it was relatively abundant (see TSC results, Table 3); several juvenile birds were also recorded.

Large numbers of swifts mainly African Black Swift *Apus barbatus* (estimates of flock size over 250 individuals) but also significant numbers of Alpine *A. melba* and Mottled Swift *A. aequatorialis* (estimates of flock size over 50 individuals) were recorded daily, feeding above grassland and along the edges of cliffs. Nyanza Swift *A. niansae* was observed daily in mixed species flocks, but in considerably lower

numbers than other members of this family (usually 3–4). Common House Martin *Delichon urbica* were present in low numbers, often in mixed flocks.

Comparison with other northern montane forests

A comparison was made of species that have been recorded in the similar northern dry montane forests of Kulal and Njiru (Borghesio pers. comm.) and Moroto (Davenport *et al.* 1996). This comparison was based on the forest dependant species (forest specialist FF, and forest generalist F) for each site. Loima had 19 species, Moroto 28, Kulal 16 and Njiru 26. When looking at the similarity of these sites, all mountains showed a high percentage in the similarity of their species composition, the highest being shown by Moroto and Loima (68%) and the least by Moroto and Kulal (55%, Table 4).

Table 4. Similarity matrix showing the percentage similarity between the montane forest sites.

Similarity Matrix			
	Moroto	Njiru	Kulal
Loima	68.0851	66.6667	51.4286
Kulal	54.5455	66.6667	*
Njiru	62.963	*	*
Moroto	*	*	*

The only species so far recorded at all of these sites were: Mountain Buzzard *Buteo oreophilus*, Red-chested Cuckoo *Cuculus solitarius*, Narina Trogon, African Hill Babbler *Pseudoalcippe abyssinica*, Olive Thrush, Brown Woodland Warbler and Northern Puffback. The similarity between Moroto and Loima is influenced by the presence of two species in particular that have not been recorded at Kulal and Njiru, namely Tambourine Dove *Turtur tympanistria* and African Wood Owl *Ciccaba woodfordii*. Clearly, Moroto has the greatest diversity of forest dependant species (n=28), with eight occurring only at that site. At Njiru (n=26) there are four species unrecorded from Kulal and Loima, all species typical of dry montane forests.

There were several groups of birds that were conspicuous by their absence from Eminit. No members of the genus *Apalis* were recorded. Yellow-breasted *Apalis flavida*, a bird of woodland and forest edge, was expected to occur, and this absence may be linked to isolation, as it has not been recorded in the arid woodland of north-western Kenya (Zimmerman *et al.* 1996). The absence of Grey *Apalis cinerea*, an active bird found in the canopy of similar montane forest, cannot be linked to habitat variables. It would almost certainly have been recorded were it present. Chestnut-throated *Apalis porphyrolaema* has been recorded in Moroto and in isolated montane forests south of Loima. The absence of any greenbuls, Cabanis's Greenbul *Phyllastrephus cabanisi* in particular, is odd. Resource

availability does not appear limited for an insectivorous bird such as this, which does occur on Moroto, Kulal and Njiru. This species is commonly caught in mist-nets so should have been recorded if present. Yellow-whiskered Greenbul *Andropadus latirostris* is another likely species that was not recorded. This bird is predominately frugivorous and very few sub-canopy fruiting shrubs or trees were noted. Northern Brownbul *Phyllastrephus strepitans*, a bird of woodland and forest edge, was also expected to occur since the habitat and resource availability would seem to suit this species. Silvery-cheeked Hornbill *Bycanistes brevis* was not recorded despite the presence of fruiting figs and the large trees required for nesting by this species. The absence of White-starred Forest Robin *Pogonocichla stellata* is unusual because this species is found in the lower stratum of these forest types and occurs on many isolated forest islands in Kenya and Tanzania, supporting the fact that this species has a good ability to disperse. Abyssinian Ground Thrush *Zoothera piaggiae* occurs on Kulal, Njiru and Moroto but is absent at Loima.

There are several reasons why these species may be missing including: 1) they were missed by the survey team, although this is unlikely for those species which are vocal or gregarious (e.g. some of the apalises); 2) some aspect of the habitat was unsuitable. The stratification of the vegetation seemed to have a large impact on avian diversity, and the feeding ecology of many of the bird species. Many of the species normally associated with undergrowth were notably absent, while insectivorous and omnivorous species one would normally associate with undergrowth were regularly observed in the sub-canopy and canopy. 3) they have been unable to colonise the site due to poor dispersal ability and/or lack of historical habitat connectedness.

White-browed Robin-Chat *Cossypha heuglini* was collected in the Loima Hills in 1962 by Joseph Mwaki for A.D. Forbes-Watson, but was not recorded during the current survey.

Threats and conservation recommendations

The threats to biodiversity at this site are varied. Firstly, the presence of fire arms has almost certainly greatly reduced wildlife populations. Although dikdik are fairly common, these were the only "large" mammals that were observed in the acacia woodland. It is unlikely that opportunistic hunting with firearms would affect the avifauna as the cost of a single round would not be justified by the meat gained. However, gunfire was heard several times during this two week survey suggesting that ammunition was not hard to obtain.

The large amounts of fuel wood still available around the Loima Hills and within Eminit Forest would indicate that felling trees for firewood by local people is not a cause of concern. Within Eminit Forest there were no signs of felling for fuelwood or timber, though several trees had been burnt for wild honey. In a couple of instances, *Podocarpus*

falcatus were felled for seemingly no apparent reason other than to allow light through to the forest floor and create grazing for future use.

The major conservation concern encountered was charcoal production. This activity is mainly restricted to the *Acacia tortillis* riverine woodland running from the Loima Hills east to Lodwar. The demand for charcoal is generated in Lodwar where the increasing population has led to an increased demand for fuel.

The indigenous land-use system previously outlined, is born of an understanding of the need for dry season grazing (for herbaceous production levels see Barrow 1988). The land-use systems that are in place are designed around a model of sustainability to ensure that this resource is protected in perpetuity for times of environmental stress. In terms of the conservation of biodiversity, the current land-use system would seem to be beneficial with the current land-users also being its guardians. However, as stated by Barrow (1988), the presence of a legal framework that acknowledges the current land-use system as well as allowing a measure of protected status is essential. Whereas definitions of protected areas such as Game Reserve, National Reserve and Biosphere Reserve are based on the exclusion of people and preservation of the natural resource to varying degrees, the best option for Loima would be a Forest Conservation Reserve with its own rules and regulations (Barrow 1988).

Conclusions

This preliminary survey shows Eminit Forest to have a relatively poor avifaunal diversity with only 19 forest dependent species of which four are forest specialists. Due to its northerly location it does represent an isolated outlier of this montane forest type, and as with other isolated mountains, Eminit represents an important refuge for the movement of birds as well as other wildlife and people. Although only four forest specialist species have so far been recorded at this site, Eminit Forest's effect on local rainfall patterns, water drainage and thus vegetation biomass over a large area is clear (Barrow 1988, Amuyunzu & Oba 1991). As such, Eminit Forest is of significance for many species of birds and wildlife that, although they are not truly forest dependant species, are very much dependant on the presence of the forest.

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References

- Amuyunzu, C.L. and Oba, G.1991. *Vegetation Resources of Central Turkana District, Kenya*. UNESCO.
- Barrow, G.C. 1988. *Loima Forest, Turkana—Its present management and future conservation issues*. Turkana Rural Development Program (NORAD).
- Bennun, L.A. and Waiyaki, E.M. 1992. *Mau Forest Complex Ornithological Survey Report*. National Museums of Kenya.
- Bennun, L.A., Dranzoa, C. & Pomeroy, D. 1996. The forest birds of Kenya and Uganda. *Journal of the East African Natural History* 85: 23–48.
- Bennun, L.A. and Njoroge, P. 1996. *Birds to watch in East Africa: A preliminary Red Data list*. Nairobi: The National Museums of Kenya.
- Britton, P.L. 1980. (ed) *Birds of East Africa*. Nairobi: The East Africa Natural History Society.
- Cunningham-van Someren, G.R. & Schifter, H. 1981. New races of montane birds from Kenya and southern Sudan. *Bulletin of the British Ornithologists' Club*
- EANHS 1996. *Check-list of the birds of Kenya*. Nairobi: Ornithological sub-committee, East Africa Natural History Society.
- Davenport, T. and Howard, P. 1996. *Moroto Forest Reserve, Biodiversity Report*. Kampala: Uganda Forest Department.
- Lewis, A. & Pomeroy D. 1989. *A bird Atlas of Kenya*. Rotterdam: A. A. Balkema Publishers.
- Oba, G. 2001. *Report on the evaluation of biodiversity in crossborders of east Africa for F.A.O. The Turkana sites of Kenya*. Noragric.
- Zimmerman, D. A., Turner, D. A. & Pearson, D. J. 1996. *Birds of Kenya and northern Tanzania*. South Africa: Russel Friedman Books.

Appendix

Bird species recorded from the foot of Loima Hills at 800m to the forested plateau at 2100m. Taxonomic order follows EANHS (1996) with their number indicated. The Kenyan bird atlas square number is given for each species following Lewis & Pomeroy (1989). Those species which are of particular conservation significance are indicated as: RNT=Regionally Near Threatened, RVu=Regionally Vulnerable and RR=Regionally Restricted (Bennun and Njoroge 1996). Ecological type for forest birds follows Bennun *et al.* (1996); FF=forest specialist, F=forest generalist and f.=forest visitor. The remaining non-forest birds are categorised as follows: W=Widespread, Wd=Woodland, G=Grassland and Fe=Forest edge. Breeding records are indicated as: SusBr=Suspected breeding and Br=Confirmed breeding.

No	Family / English name	Scientific name	Ecolog. type	Atlas sq.	Status
Accipitridae					
101	Swallow-Tailed Kite	<i>Chelictinia riocourii</i>	Wd	13C	
102	Black Kite	<i>Milvus migrans</i>	G	13C 12D	
117	Harrier Hawk	<i>Polyboroides typhus</i>	f.	13C 12D	
125	African Goshawk	<i>Accipiter tachio</i>	F	13C	
127	Shrika	<i>Accipiter badius</i>	f.	13C	
134	Great Sparrowhawk	<i>Accipiter melanoleucus</i>	F	13C 12D	
139	Mountain Buzzard	<i>Buteo oreophilus</i>	FF	13C 12D	RNT
142	Augur Buzzard	<i>Buteo augur</i>	W	13C	
158	Martial Eagle	<i>Polemaetus bellicosus</i>	W	13C	RVu
159	Pygmy Falcon	<i>Polihierax semitorquatus</i>	Wd	13C	
162	Peregrine Falcon	<i>Falco peregrinus</i>	Fe	13C 12D	
166	African Hobby	<i>Falco cuvieri</i>	F	13C 12D	
174	Fox Kestrel	<i>Falco alopex</i>	Wd	13C	
Phasianidae					
190	Crested Francolin	<i>Francolinus sephaena</i>	Wd	13C	
Glareolidae					
257	Somali Courser	<i>Cursorius somalensis</i>	Wd	13C	
Columbidae					
357	Tambourine Dove	<i>Turtur tympanistria</i>	F	13C 12D	
359	Emerald-spotted Wood Dove	<i>Turtur chalcospilos</i>	f.	13C	
365	Olive Pigeon	<i>Columba arquatrix</i>	FF	13C	
366	Speckled Pigeon	<i>Columba guinea</i>	Wd	13C	
371	Mourning Dove	<i>Streptopelia decipiens</i>	Wd	13C	
376	Dusky Turtle Dove	<i>Streptopelia lugens</i>	f.	13C 12D	
Musophagidae					
399	White-crested Turaco	<i>Tauraco leucolophus</i>	f.	13C 12D	
401	White-bellied Go-away-bird	<i>Corythaixoides leucogaster</i>	Wd	13C	
Cuculidae					
409	Red-chested Cuckoo	<i>Cuculus solitarius</i>	F	13C 12D	
417	Emerald Cuckoo	<i>Chrysococcyx cupreus</i>	F	13C 12D	
419	Klaas's Cuckoo	<i>Chrysococcyx klaas</i>	F	13C 12D	
422	White-browed Coucal	<i>Centropus superciliosus</i>	Fe	13C	
Strigidae					
444	Wood Owl	<i>Ciccaba woodfordii</i>	F	13C	
Caprimulgidae					
449	Montane Nightjar	<i>Caprimulgus poliocephalus</i>	F	13C 12D	
460	Slender-tailed Nightjar	<i>Caprimulgus clarus</i>	Wd	13C	

Apodidae				
471	African Black Swift	<i>Apus barbatus</i>	W	13C 12D
473	Nyanza Swift	<i>Apus niansae</i>	W	13C 12D
475	Mottled Swift	<i>Apus aequatorialis</i>	W	13C 12D
476	Alpine Swift	<i>Apus melba</i>	W	13C 12D
Coliidae				
482	Blue-naped Mousebird	<i>Urocolius macrourus</i>	Wd	13C
Trogonidae				
484	Narina Trogon	<i>Apaloderma narina</i>	F	13C 12D
Meropidae				
505	White-throated Bee-eater	<i>Merops albicollis</i>	f.	13C
Coraciidae				
518	Abyssinian Roller	<i>Coracias abyssinica</i>	Wd	13C
Upupidae				
542	Hoopoe	<i>Upupa epops</i>	Wd	13C
Phoeniculidae				
532	Abyssinian Scimitarbill	<i>Rhinopomastus minor</i>	Wd	13C
Bucerotidae				
539	Eastern Yellow-billed hornbill	<i>Tockus flavirostris</i>	Wd	13C
Capitonidae				
564	Red-fronted Tinkerbird	<i>Pogoniulus pusillus</i>	Fe	13C
582	Red-and-yellow Barbet	<i>Trachylaemus erythrocephalus</i>	Wd	13C
583	d'Arnaud's Barbet	<i>Trachylaemus darnaudii</i>	Wd	13C
Indicatoridae				
585	Scaly-throated Honeyguide	<i>Indicator variegatus</i>	f.	13C 12D Br. (Juv)
Picidae				
601	Nubian Woodpecker	<i>Campethera nubica</i>	Fe	13C
610	Cardinal Woodpecker	<i>Denropicos fuscescens</i>	Wd	13C
Hirundinidae				
669	Common House Martin	<i>Delichon urbica</i>	W	13C 12D
Pycnotidae				
729	Common Bulbul	<i>Pycnonotus barbatus</i>	f.	13C
Timaliidae				
737	African Hill Babbler	<i>Pseudoalcippe abyssinica</i>	FF	13C
746	Rufous Chatterer	<i>Turdoides rubiginosus</i>	Wd	13C
Turdidae				
769	Cape Robin-Chat	<i>Cossypha caffra</i>	f.	13C
772	White-browed Robin Chat	<i>Cossypha heuglini</i>	f	*
786	White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	Wd	13C
816	Olive Thrush	<i>Turdus olivaceus</i>	F	13C 12D
Muscicapidae				
831	Dusky Flycatcher	<i>Muscicapa adusta</i>	F	13C Br.
840	White-eyed Slaty Flycatcher	<i>Melaenornis fischeri</i>	F	13C RR,SusBr.
844	African Grey Flycatcher	<i>Bradornis microrhynchus</i>	Wd	13C
Sylviidae				
876	Brown Woodland Warbler	<i>Phylloscopus umbrovirens</i>	F	13C 12D
884	Cinnamon Bracken Warbler	<i>Bradypterus cinnamomeus</i>	F	13C
930	Grey Wren Warbler	<i>Calamanastes simplex</i>	Wd	13C
933	Grey-backed Camaroptera	<i>Camaroptera brachyura</i>	f.	13C Br.
963	Red-faced Crombec	<i>Sylvietta whytii</i>	Wd	13C

971	Yellow-vented Eremomela	<i>Eremomela flavicrissalis</i>	Wd	13C	
Zosteropidae					
983	Yellow White-eye	<i>Zosterops senegalensis</i>	f.	13C 12D	
Remizidae					
990	White-bellied Tit	<i>Parus albiventris</i>	f.	13C	
Monarchidae					
1007	Paradise Flycatcher	<i>Terpsiphone viridis</i>	f.	13C 12D	Br. **
Platysteiridae					
1013	Chin-spot Batis	<i>Batis molitor</i>	Fe	13C	
Laniidae					
1043	Common Fiscal	<i>Lanius collaris</i>	G	13C	
Malaconotidae					
1048	Brown Crowned Tchagra	<i>Tchagra australis</i>	Fe	13C	
1070	Slate-coloured Boubou	<i>Laniarius funebris</i>	G	13C	
1071	Northern Puffback	<i>Dryoscopus gambensis</i>	F	13C 12D	Br.
1080	Grey Cuckoo-shrike	<i>Coracina caesia</i>	FF	13C	SusBr.
Dicruridae					
1082	Common Drongo	<i>Dicrurus adsimilis</i>	Wd	13C	
Corvidae					
1097	Fan-tailed Raven	<i>Corvus rhipidurus</i>	G	13C	
Sturnidae					
1126	Magpie Starling	<i>Speculipastor bicolor</i>	Wd	13C	
Nectariniidae					
1135	Eastern Violet-backed Sunbird	<i>Anthreptes orientalis</i>	Wd	13C	
1149	Amethyst Sunbird	<i>Nectarinia amethystina</i>	f.	13C	Br.
1152	Variable Sunbird	<i>Nectarinia venusta</i>	f.	13C	Br.
Passeridae					
1190	Yellow-spotted Petronia	<i>Petronia pyrgita</i>	Wd	13C	
Ploceidae					
1193	White-headed Buffalo Weaver	<i>Dinemellia dinemelli</i>	Wd	13C	
b1205	Baglafaect Weaver	<i>Ploceus baglafaect</i>	f.	13C 12D	Br.
1226	Vitelline Masked Weaver	<i>Ploceus velatus</i>	Wd	13C	
1247	Red-headed Weaver	<i>Anaplectes rubriceps</i>	Wd	13C	
Estrilididae					
1311	Purple Grenadier	<i>Uraeginthus ianthinogaster</i>	Wd	13C	
Fringillidae					
1332	Yellow-crowned Canary	<i>Serinus canicollis</i>	f.	13C	
1336	White-bellied Canary	<i>Serinus dorsostratus</i>	Wd	13C	
Emberizidae					
1352	Cinnamon-breasted Rock Bunting	<i>Emberiza tahapisi</i>	Wd	13C	

* Collected J.Mwaki for A.D.Watson (1962)

** White and rufous morphs occur

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